WINGED VICTORY

THE HISTORY OF THE NIKE MISSILE TRAINING PROGRAM AT FORT BLISS

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THE HISTORY OF THE NIKE MISSILE TRAINING PROGRAM AT FORT BLISS

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FORT BLISS, TEXAS

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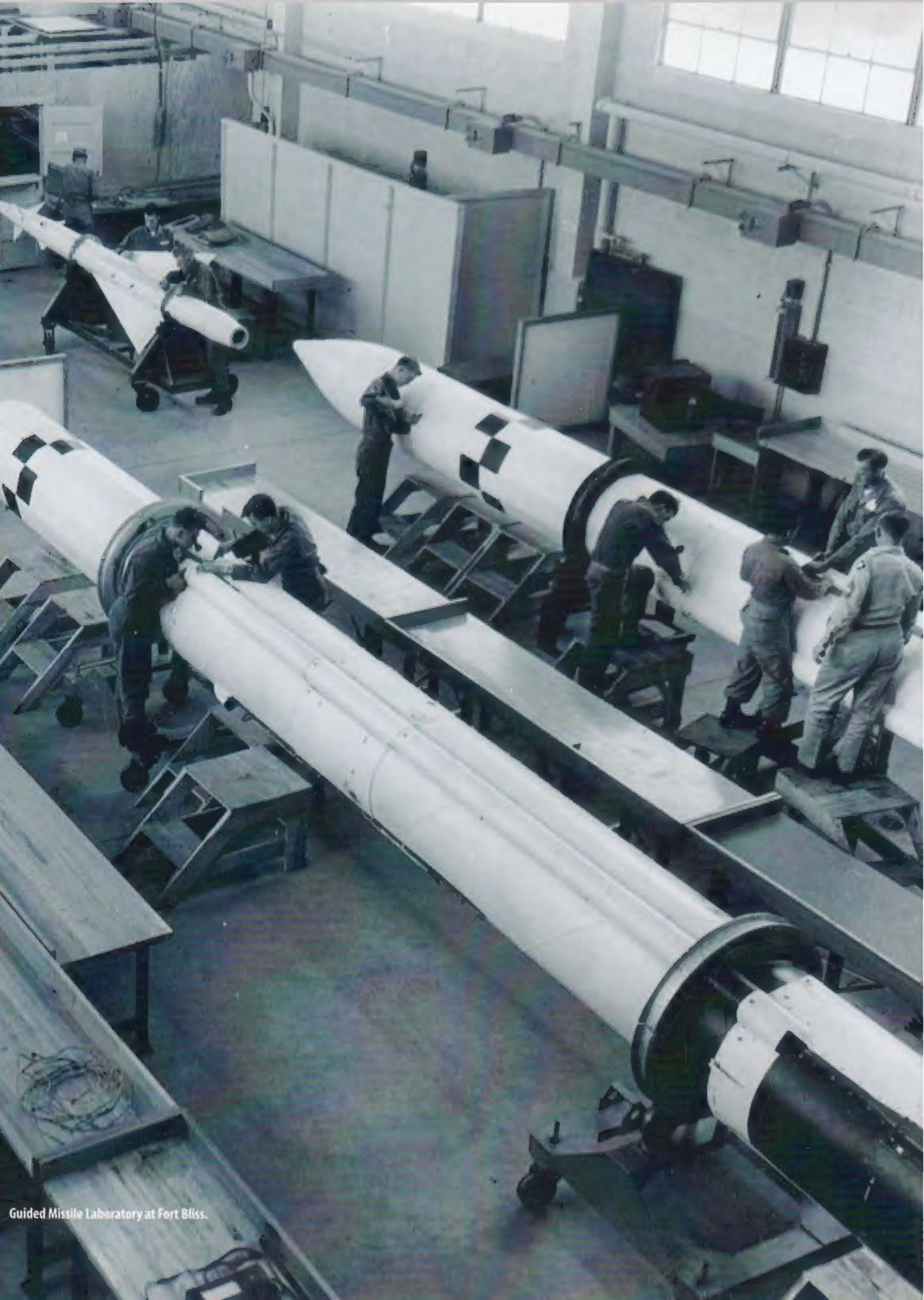

Guided Missile Laboratory at Fort Bliss.

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William A. Dodge

Timothy L. Sawyer

Albuquerque, New Mexico

1944 War Department requests funding to develop missile weaponry in response to Nazi Germany's V-1 rocket program

1945 Operation Paperclip brings German scientists and confiscated missile parts to Fort Bliss to continue research in the development of the V-2 rocket – the world's first ballistic missile

- All Army Antiaircraft Artillery School sites are consolidated into one location at Fort Bliss, Texas
- White Sands Proving Ground established (July 9)

1946 British Prime Minister Winston Churchill delivers his "Iron Curtain" speech, marking the beginning of a political era known as the Cold War

- US Army Antiaircraft Artillery Defense and Guided Missile Center at Fort Bliss becomes Antiaircraft and Guided Missile Branch

1948 The Department of Guided Missiles is formed at Fort Bliss to meet the need for expanded research, development, and training in guided missile technology

1949 The Soviet Union detonates an atomic bomb (August 29), and thus becomes the world's second nuclear power

1950 Communist-backed North Korean forces attack US ally South Korea, thus initiating the Korean Conflict (June)

- The US Army consolidates its control of ground-based antiaircraft artillery and forms the Army Antiaircraft Command (ARAAACOM)

1951 The 1st Guided Missile Group at Fort Bliss successfully fires a LARK missile – a first generation surface-to-air missiles (SAM)

- The first-generation Nike Ajax is successfully test fired at White Sands Proving Grounds, New Mexico (November)

1952 A combined Nike/Corporal missile program is initiated at Fort Bliss

1953 The Nike missile system is approved for deployment

- Nike Package Training Program instituted at the Fort Bliss Air Defense School
- Package Number 2 of the First2First Guided Missile Brigade successfully fires a Nike Ajax missile at the Red Canyon Range (October 28)
- The first class of international students representing seven allied nations is welcomed to Fort Bliss

1954 The Nike Ajax is first deployed at Fort Meade, Maryland

1955 The Soviet Union unveils the Tupolev Bull Tu-4 aircraft, which has the capability to carry an atomic bomb over the North American continent

- The US establishes a new, multi-tiered air defense system comprised of the Distant Early Warning (DEW) Line above the Arctic Circle, the Mid-Canada Line, and the Pinetree Line at the US-Canada border

1956 US Army Antiaircraft Artillery and Guided Missile Center is renamed the US Army Air Defense Center

- All training for surface-to-surface missiles, such as the Corporal and Loon, is transferred to Fort Sill, Oklahoma

TIMELINE

- The third-generation Nike missile – Zeus – is under design. It is the US's first anti-ballistic missile (ABM)

1957 ARAACOM is renamed US Army Air Defense Command (USARADCOM)

- Fort Bliss opens the McGregor Range to accommodate Nike missile batteries annual service practice requirements

1958 The Army begins conversion from Nike Ajax to Nike Hercules missiles (March). The first battery to be converted is the Montrose/Belmont site in the Chicago Defense Area (June 30)

- The Department of Guided Missiles is reorganized into six sections to facilitate Nike Ajax, Nike Hercules, and HAWK missile training

1959 Fort Bliss closes the Red Canyon Range and moves all training operations to the McGregor Range (June)

- The first National Guard units are trained to operate Nike missile batteries

1960 Cuban missile crisis puts US armed forces, including the Nike missile batteries, on high alert (October)

1962 Nike Hercules is fully deployed at Nike missile batteries across the US

- Nike Zeus is successfully test-fired at Kwajalein Island in the Pacific

1961 USARADCOM is renamed the Army Air Defense Command (ARADCOM)

- More than 200 Nike missile batteries are deployed around major population centers in the US

1963 A total of 1,670 Nike trainees from sixteen different countries are stationed at Fort Bliss

1964 Nike missile training at Fort Bliss reaches its apex, graduating 8,000 new trainees

- The Air Defense School undergoes reorganization

1966 Training courses are prepared for the third generation of Nike missiles – the Nike X (formerly named Zeus) – however, by the end of the decade this missile is replaced by the Sentinel missile system (renamed SAFEGUARD)

1974 The last Nike missile battery in the US is inactivated as new antiballistic missile systems are developed

- Training at Fort Bliss is shifted to accommodate international military personnel from US-allied nations

1975 SAFEGUARD antiballistic missile system, the last new system to a use a Nike missile, is deployed and then promptly deactivated for political reasons

1980s Nike missile systems are phased out internationally

1991 The Cold War effectively ends with the collapse of the Soviet Union

2005 The Base Realignment and Closure (BRAC) Commission recommends all Army artillery training be relocated to Fort Sill

INTRODUCTION: AIR DEFENSE TRAINING AND FORT BLISS

Since 1945, the U.S. Army Antiaircraft Artillery (AAA) Defense School and Guided Missile Center, simply known as the "Air Defense School," has provided training to thousands of soldiers from not only the U.S. Army but fifty-eight allied nations. In 1946 the Antiaircraft Artillery School at Fort Bliss became the Antiaircraft and Guided Missile Branch, as Fort Bliss prepared itself to become the premier guided missile training site in the world. For the next four decades, Fort Bliss' training programs for Nike, Spartan, Sprint, and Safeguard missile systems were in the forefront of air defense strategies that sustained the United States through the turbulent Cold War years of American history.

Midway through the twentieth century, the United States Army Antiaircraft Artillery command was faced with a new challenge, one that would have a lasting effect on air defense strategies for the next fifty years. The development and successful deployment of the V-1 rocket by Nazi Germany against the Allies in the final years of World War II marked a seminal moment in air defense history and resulted in the War Department's request in 1944 for funding to develop its own missile weaponry to counteract this new and deadly technology. As a result, the Army established a new sub-office for rocket development at the post, and the race to develop new guided missile technology was on.

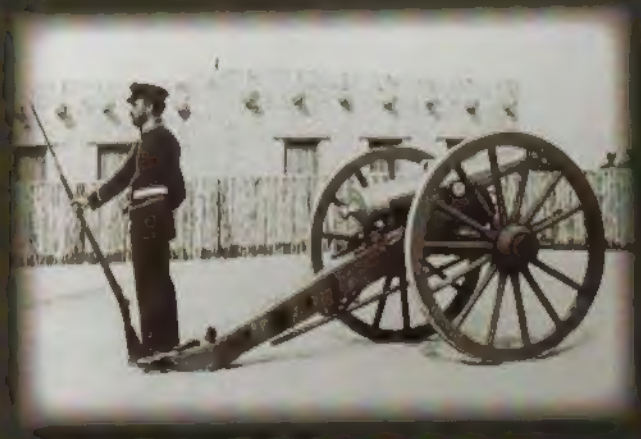
The development of ground based artillery and the training of soldiers to operate these weapons was not a new task for Army personnel. The Army's Coast Artillery School began at Fortress Monroe near Hampton Roads, Virginia in 1824. Between 1824 and 1836, the school trained men to fire heavy guns in defense against naval attacks, then the major threat to American shores. Although the school was suspended during the American Civil War, it reopened in 1868 as the Army Artillery School. Its expanded curriculum included courses in mathematics, artillery tactics, engineering, astronomy, international law, mechanics, military history, survey gunnery, and ordnance. In short, it was the military's first modern artillery school and it set a precedent for the well-rounded curriculum structure of future schools.

In 1907, the Artillery School was divided into two sections and set up in different installations – the Coast Artillery School at Fort Monroe and the School of Fire at Fort Sill, Oklahoma (the latter was renamed the Field Artillery School in 1919). World War I saw the introduction of the airplane as a tactical weapon, and to counteract this new threat from the sky, the Army developed the first antiaircraft gun. This required new, specialized training courses on topics such as antiaircraft position finding equipment, data-transmission systems, searchlights, and sound locators. Following the end of World War I, the Army recognized the need to establish an antiaircraft perimeter along the coasts of the continental United States in order to carry out its mission of "denial of penetration" by enemy aircraft. Fixed installations were set up along the coasts to detect, attack, and destroy such aircraft.

As World War II loomed on the horizon, the Army bolstered its air defenses by replacing its outmoded

(Above) Gen. John J. Pershing Meets with Pancho Villa and Alvarado Obregon.
(Below) Soldier in 1850s Uniform at Fort Bliss Replica Museum.

3-inch antiaircraft gun, the M1918, with the 40mm Bofors automatic cannon for low-attack aircraft, and the radar-directed 90mm gun for high altitude targets. This in turn prompted the need for larger training facilities and the Army moved its Coast Artillery School to Camp Davis, North Carolina, in 1942. A new Antiaircraft Artillery School was created at Camp Davis in May of that year. In addition to the Camp Davis facility, training sites for the new school were distributed across the United States at five other locations: Fort Sheridan, Illinois; Camp Edwards, Massachusetts; Camp Hulen, Texas; Camp Haan, California; and Fort Bliss, Texas. By the end of 1945, all Antiaircraft Artillery School sites had been consolidated at Fort Bliss.



Founded primarily as an infantry post in 1848 to guard United States' interests in the newly acquired territory following the Mexican-American War, Fort Bliss has been used by the Army since the mid-nineteenth century. The post moved to its present location on Noria Mesa in 1893 and supplied troops for the Spanish-American War. With the arrival of the Fourth Cavalry in 1911, the post became a valuable strategic base of operations for General John J. Pershing's forays into Mexico in search of Pancho Villa's rebel army in 1916. Its location amidst the wide open spaces of west Texas, with additional test ranges in southern New Mexico, made the fort an ideal place for antiaircraft artillery

(Opposite) Field Artillery Maneuvers at Fort Bliss, circa Late 1930s.

training—the area was sparsely populated, the installation had enough land to accommodate several different firing ranges (more than 12,000 acres by 1944), and the region's mild climate made the area available for year-round training.

Use of anti-aircraft artillery went into decline immediately following World War II, but was revived with the beginning of the Korean War in 1950. The Army, which had been in competition with the newly formed United States Air Force for control over anti-aircraft artillery, consolidated its hold on ground-based anti-aircraft artillery with the formation of the Army Antiaircraft Command (ARAACOM), a major command unit within the United States Army, in 1950. In 1957 this major command was renamed United States Army Air Defense Command (USARADCOM), and in 1961 it was again renamed, this time to the Army Air Defense Command (ARADCOM). Today, what was formerly known as anti-aircraft artillery (AAA) is referred to as Air Defense Artillery (ADA).

With the Army consolidating its control of ground-based air defense, antiaircraft defense underwent a radical transformation during the early Cold War years. Conventional "tube" artillery was no longer adequate to defend against high-flying, ultra-fast jet-powered aircraft, such as the Soviet Union's "Bear" and "Bison" long-range bombers being developed and deployed during the 1950s. The United States Army turned to the new missile technology being tested at White Sands Missile Range for solutions.

The answer came in the form of guided surface-to-air missiles, which were developed at the Fort Bliss and White Sands test ranges. These missiles would be able to travel high enough and fast enough to bring down Soviet strategic long-range jet and turbo-prop bombers. They could also be guided via ground-controlled radar to account for an enemy aircraft's evasive maneuvers, something that was beyond the capacity of conventional "tube" artillery. Thus was born the concept for the Nike missile system.

The new defensive missile system would require a radical new approach to training and teaching the personnel who would be required to man these ground-based defense systems. Much like the need to upgrade the artillery training curriculum following the Civil War, the development of the guided missile program following World War II necessitated new courses on the mechanics of guided missiles, operating procedures for detection and launch units, and college-level courses in mathematics, mechanics, physics, engineering, electronics, and radar. This required a complete overhaul of training programs, both in the classroom and on the test range. Fort Bliss would be the home to this radically transformed training program for thousands of military personnel for the duration of Nike missile systems deployment and beyond.

In many ways, the fortunes of the Air Defense School at Fort Bliss paralleled the course of the Cold War as well. Although the Nike defensive missile rings around American cities and military targets were almost all decommissioned by the middle 1970s, their one-time presence and the existing remnants today are testimony to the very real threat of nuclear war that existed at that time, as well as to the dedication and training of Army and National Guard personnel who manned Nike sites during the Cold War. This history will offer an understanding of the events that brought about the development of guided missile technology, as well as insight into the types of training necessitated by the new technology, and how Fort Bliss integrated this training into its overall mission.

(Left to Right) Ajax, Hercules and Zeus Missiles on Display.

altitudes of 60,000 feet

NIKE AJAX, HERCULES, AND ANTI-BALLISTIC MISSILE SYSTEMS

ers, rather than just one aircraft.

nation.

over the Pacific.

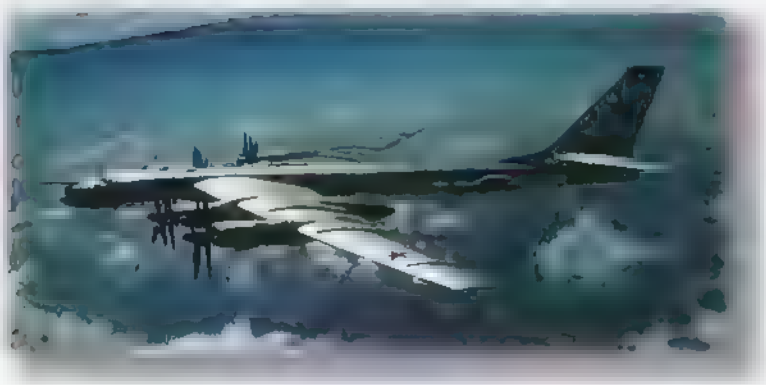
in Nekoma, North Dakota, in 1975.

THE COLD WAR & ANTI-AIRCRAFT DEFENSE SYSTEMS

In the background of everyday life in America during the Cold War, particularly in the 1950s and 1960s, was the constant fear of nuclear annihilation. The Soviet Union had unveiled a significant advance in their aircraft technology at a military review in Moscow in 1947 – the Tupolev Bull Tu-4 aircraft, which had the capability to carry and drop the atomic bomb. By the mid-1950s the Soviets had developed both atomic and hydrogen bombs as well as the Tu-95 Bear, the Soviets' signature high-altitude long-range intercontinental bomber. These achievements heightened the fears of American military strategists who now believed that a nuclear attack by the aggressive, expansionist Soviet Union upon the United States, launched over the North Pole and arriving over undefended cities in America's heartland, was not only possible, it was likely.

Fear of long-range strategic bomber attacks by the Soviets drove American military policy makers in the years following World War II to envision ways to defend against such an attack. The seeds of both the annihilation that United States policy-makers feared and the ways to prevent it were sown at the end of the war.

Soviet-Built Tu-95 "Bear" Bomber.



By 1945, much of Europe was in ruins – its cities, its towns, and even its national identities crushed by nearly seven years of war. Also emerging from the ashes of the world conflict were two new superpowers to replace the receding European colonial powers: the United States of America, and the Union of Soviet Socialist Republics. In the war's waning months, the Soviets penetrated into eastern Germany and beyond Berlin, claiming a wide swath of territories by mid-1945 that greatly expanded their political influence westward. The United States and its allies, meanwhile, had driven into the German heartland from the west, while also conducting a separate theater of war against the Japanese empire in the Pacific. Mobilized by the necessity of waging war on two large fronts, the United States emerged from the conflict an industrial and military juggernaut.

But in the period immediately following the war, the United States military experienced a massive drawdown in its budget, equipment, and personnel. Worn down by years of war and rationing, American citizens craved a return to normalcy. But an enduring peace was not to be. Relations between the two superpowers had quickly soured as they struggled over the disposition of the rebuilding nations of Europe and of farther-flung parts of the world. Soviet leader Joseph Stalin announced his nation's intentions to develop atomic weaponry to compete with the United States, setting the stage for an East-West rivalry that would last for four decades. When it became clear that an "Iron Curtain" would descend between East and West and that a larger portion of Europe could fall

The Iron Curtain Delineated Soviet Bloc Countries (in Red) from Western Allies (Shown in Blue).

site in Kazakhstan, which prompted President Truman

would be a thousand times

nium and plutonium bombs

both the United States and

other's homelands.

the United Nations to intervene.

the rest of the world.

Command (ARAACOM).

Command (ARAACOM).

During the mid-1950s, the Soviets did develop such long-range bombers. The most important of these was the Tupolev Bear, which, in its Tu-95 iteration, became the counterpart to the U.S. Boeing B-52 long range strategic bombers, also first deployed in the mid-1950s. Powered by new ultra-fast turboprop engines, the swept-wing Tu-95 bombers were capable of flying too high and too fast for conventional anti-aircraft guns to be effective against them. With a flight radius of 8,000 miles without refueling, these aircraft were capable of penetrating into the continental United States from the northern Soviet Union with multi-megaton thermonuclear payloads of up to 25,000 pounds. With refueling capabilities, they could conceivably remain airborne for far greater distances, and could travel at speeds comparable to heavy jet aircraft.

By 1955, the United States was putting new detection systems in place to counteract the potential Soviet strategic bomber and missile threat. An air defense system consisting of three chains of early warning radar was approved. The first, northernmost line of detection for bombers was the DEW (Distant Early Warning) Line, above the Arctic Circle, in the far north of Alaska, Canada, and Greenland; the second, intermediate line of detection was the Mid-Canada Line; and the third and southernmost was the Pinetree Line, located near the United States-Canadian border.

In addition to detection systems, specific defensive systems needed to be developed to respond to the new Russian strategic bomber threat and nuclear capability. It became clear that the defensive anti-aircraft systems that had been under development since the end of World War II would need to be deployed soon to defend against these threats. The need for new anti-aircraft technology had become apparent in the waning stages of World War II when the Germans deployed the Messerschmitt Me-262 – the first mass-produced jet fighter. Although developed too late in the war to stop the Allied advance through Europe, the clear superiority of jet technology, coupled with the supersonic V-2 missiles that had been used to devastating effect toward the war's end, signaled that a new era in artillery had arrived. Flying at an altitude of fifty miles and a speed of 3,600 miles per hour, the V-2 rocket traveled beyond the range and speed of any conventional "tube" anti-aircraft artillery of World War II. It became obvious that the answer to the threats posed by jet fighters and long-range strategic bombers lay in missile technology – the basis for the Nike missile program.

During the final months of the war, the United States and the Soviet Union both coveted the technology behind these German weapons of mass destruction. Fortunately,

(Opposite) President Dwight D. Eisenhower.
(Left) The DEW Line.
(Bottom) Werner von Braun.

Nike Ajax "Package" - 67th AAA, D Battery.

A TYPICAL NIKE MISSILE SITE

Once the personnel in a Nike missile "package" – the platoons of men required to man and maintain a missile installation – had completed their training, they and their equipment, including the radar vans, battery control vans, missiles, and other equipment, were moved across country from Fort Bliss to their missile sites, where facilities to house them and their equipment were prepared for them in advance of their arrival. Later, after all the missile sites had been established, newly graduated missile personnel were sent on to missile sites from Fort Bliss to replace those servicemen within Nike packages who had completed their active Army duty.

Lt. Paul Parks at Firing Console in Battery Control Van, 2nd ADA Group, New York, 1957.

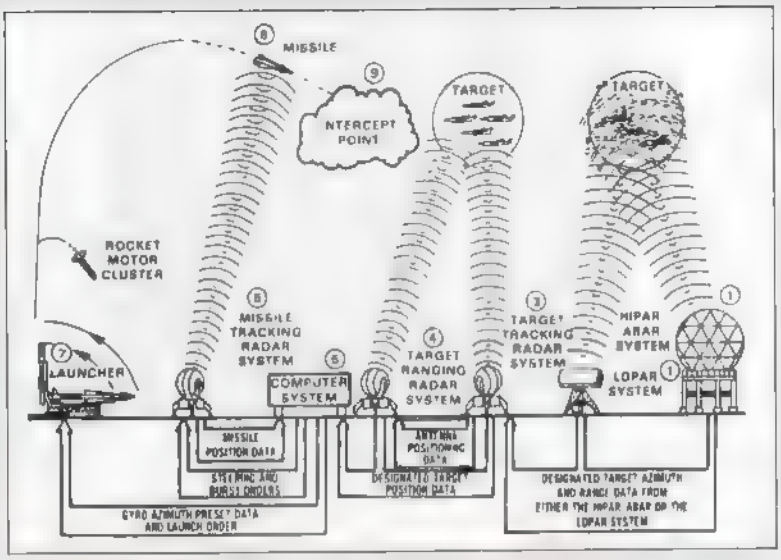
By July of 1963, the organization of the Army Air Defense Command (ARADCOM) consisted of seven regions, within each of which were several Defense areas, arranged around major cities and/or military installations. Very large cities often had more than ten missile batteries arrayed around their metropolitan areas; other major cities might have four to six installations. Chicago, for example, as the Midwest's largest cluster of civilian population and military and industrial installations, had twenty-two Nike missile batteries – the largest single concentration of batteries in the nation.

A typical Nike missile battery consisted of two components located in two separate areas: the Integrated Fire Control Area (IFC) and the Launch Area. The IFC was positioned at least one to two miles away from the Launch Area and needed to occupy higher ground than the launch complex in order for radar to track the missiles.

In all, a Nike battery utilized four radars, including the Target Tracking Radar (TTR), the Target Ranging Radar (TRR), the Missile Tracking Radar (MTR), and the High-Powered Acquisition Radar (HIPAR).

The HIPAR was the radar that searched the skies for incoming targets at long range. It had a greater range than the TTR and the TRR. These latter two radars were used to track the target and to communicate its range, altitude, and speed to the IFC's computer, which relayed this information via the MTR to the missile fired at the incoming target in order to adjust its course and speed. The Missile Tracking Radar, as its name suggests, was used to guide the missile and send a detonation command to it once it reached its target.

Also located at the IFC building were two vans, one of which was the battery (or "fire") control van, and the other of which was for radar control. The battery control van was in communication with the Army



Air Defense Command Post (AADCP), which oversaw the batteries in the area. The AADCP was in communication with the NORAD (North American Air Defense) Control Centers, which were in turn commanded by Regional NORAD commanders.

From the battery control van, the commanding officer of the battery coordinated his activities with the NORAD Control Center, and communicated with the other members of the IFC and launcher area platoons. The fire button was also located inside the battery control van.

The radar control van held all radar tracking equipment, including the tracking consoles and computers for the MTR, TTR, TRR, and HIPAR, all of which required constant testing and maintenance.

Nike Hercules Crew Performs Readiness Drill at the Montrose/Belmont Site, Chicago, February, 1959.

Battery Control Van.

Personnel from the package who were stationed at the Integrated Fire Control Area as members of the IFC platoon were as follows: a battery control officer, an acquisition radar operator, a computer switchboard operator, an early warning plotter, a generator specialist, a missile track radar operator, a target track radar azimuth operator, and a target track radar elevation operator.

The missiles were stored at the Launch Area, where they were also assembled and maintained. Typically, the missiles were stored in underground facilities and were raised and lowered on elevator platforms, with a launch pad above the storage facility. A launching platoon -- the complement of men from the package which was assigned to the Launch Area --consisted of three "sections"; there were four actual launchers per section, for a total of twelve launchers in a typical launch area. Personnel who were stationed at the Launch Area as part of the launching platoon were as follows: a launching control officer, a panel operator, a switchboard operator, a chief-of-section for each launching section (making for a total of three in the Launch Area), a panel operator for each section (for a total of three), four launcher crewmen for each section (for a total of twelve), and one generator operator per section (for a total of three). There were also additional non-specialist crewmembers assigned to both the IFC platoon and the launching platoon, including men who helped with the maintenance of facilities, guard duty, cooking and KP, etc.

Missiles at the launch facilities received a daily inspection, plus other, more in-depth inspections at greater intervals. When missile sites went "hot" during a high alert period such as the Cuban Missile Crisis of October 1962, the platoons stayed at the respective posts at the IFC and Launch Complexes until they were told to stand down. Bunks and small recreation facilities were provided at both the Launch Control Area and the IFC. Otherwise, during their shifts the men stayed in the battery control building at the IFC, where more permanent quarters were located.

M-33 Acquisition Antenna at Nike Site, Lorton, Virginia, March, 1955.

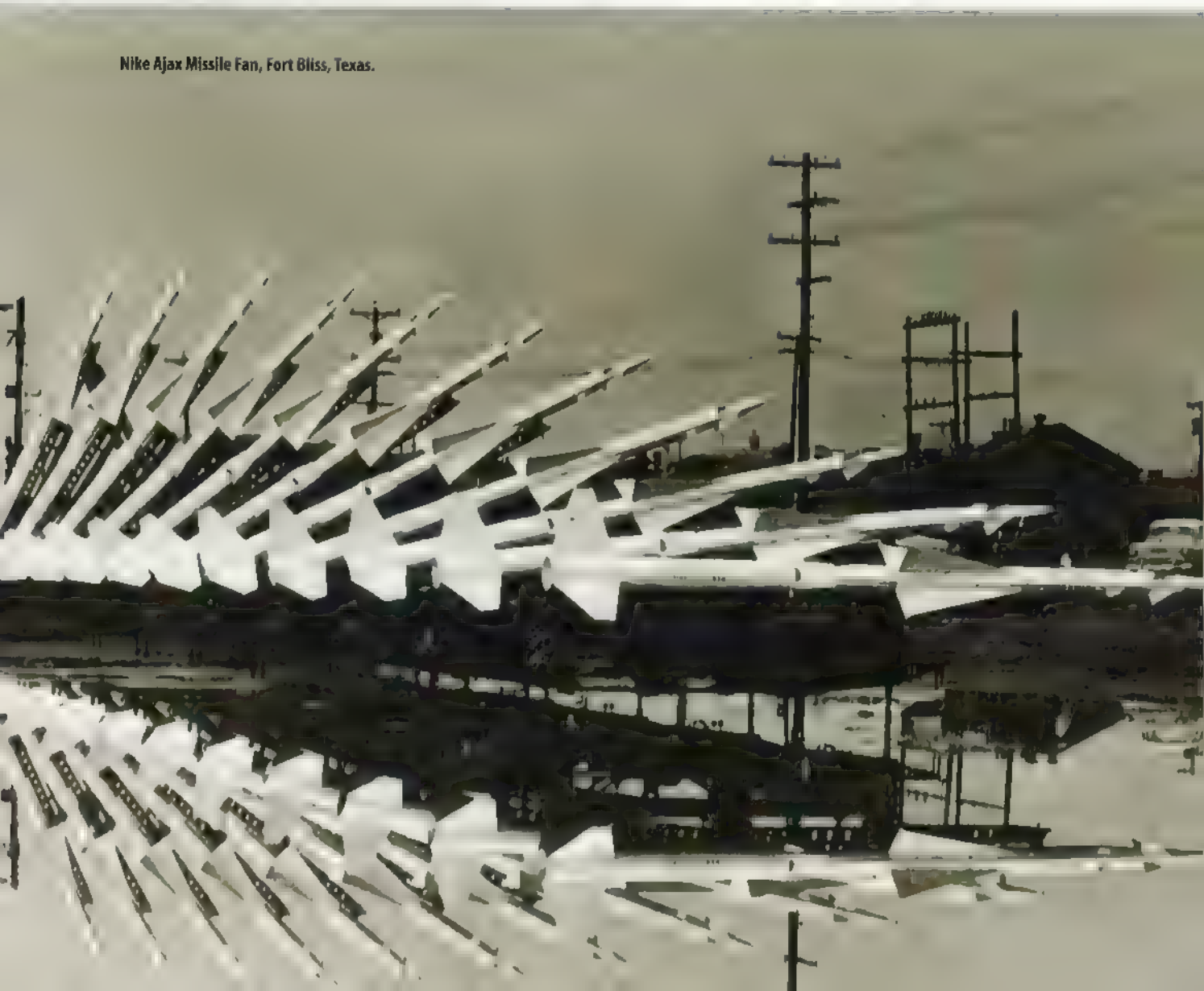
Although packages dispatched to their missile installations around the country were finished with training, during their time at a Nike missile installation, Nike package personnel continued to drill on a regular basis to make sure they could carry out a live missile firing if circumstances, such as an actual enemy bomber attack, called upon them to do so. Regardless of the thoroughness of their Fort Bliss training, personnel in each package strived to continue to familiarize themselves with the system and to be able to launch missiles at a moment's notice. While the vast majority of missile installations could not actually conduct live firings at their specific sites because of the risk to surrounding civilian populations, personnel were brought each year to Red Canyon or McGregor test ranges to conduct their annual service practice (ASP), which involved assembling and firing between one to three missiles.

During the late 1950s, as a cost-saving measure, the Army began training National Guardsmen at Fort Bliss, and gradually turning the sites over to teams manned by local contingents of Guardsmen, who were able to live at home while remaining on alert. These "citizen-soldiers" maintained the same vigilance as regular Army personnel over the remaining active years of Nike deployment until they, too, were phased out in September of 1974. A farewell ceremony for the Guard's role in the Nike program was held at Indiantown Gap Military Reservation in Pennsylvania, the headquarters for the Pennsylvania Air and Army National Guards, with field artillery salutes and formations of Guard helicopters in attendance, on September 14, 1974. The farewell ceremony took place sixteen years to the day after the first National Guard-manned Nike site was inaugurated in the Los Angeles air defense system, on September 14, 1958.

Nike Launch Area, Vicinity of Baltimore, Maryland.

NIKE TRAINING AT FORT BLISS

During the Cold War, the most comprehensive defensive missile training school in the world was located at Fort Bliss, near El Paso, Texas. It had been conceived in the late 1940s as part of a program to deploy anti-aircraft defensive missile installations nationwide and man these installations with highly trained United States Army personnel. By 1949, Fort Bliss had become the center of all training for surface-to-air, surface-to-surface, air-to-surface, and air-to-air guided missiles. This initial training was mainly theoretical, since there was as yet no equipment with which to train. By 1953, the Nike Missile system, which had been test-fired initially in 1951, was approved for deployment, and training specifically for this system began in that year. Fort Bliss was destined to become the global center for the training of Allied personnel from other nations using the Nike missile systems as well. The goal of the Nike missile program was to assemble a full continental United States defense network through the development of defensive missiles with conventional and (later) nuclear warheads and automated guidance systems supported by long-range, high rate acquisition radar. This goal was predicated on a major overhaul of the Army's Anti-aircraft Artillery (AAA) training program undertaken to incorporate the new sophisticated weapons technology – missiles, detecting and tracking radars, and firing controls – that was being developed in the late 1940s. The AAA school at Fort Bliss seemed to be the



Nike Ajax Missile Fan, Fort Bliss, Texas.

Nike Missile Maintenance Test, February, 1961.

perfect venue to host such training, and in 1948 the need for expanded training was emphasized by the creation of a new department for research, development, and training in guided missile technology, called the Department of Guided Missiles.

From its inception, the mission of the Department of Guided Missiles was to (1) teach tactics and techniques of guided missiles to qualify officers as commanders of guided missile units; (2) train selected enlisted men as leaders of guided missile units as well as guided missile technicians and guided missile system instructors; and (3) serve as an agent of the Army Field Forces in the development and perfection of guided missile tactics and techniques.

Initially, the guided missile training program was divided into three academic sections: (1) Guidance Stipulation, (2) Aero-Propulsion, and (3) Tactics and Gunnery. A faculty totaling twenty-nine officers, ten enlisted men from the newly formed 1st Guided Missile Group (activated in April of 1950), and three civilians representatives from Western Electric, Bell Telephone, and Douglas Aircraft) taught courses not only to United States Army personnel, but also to officers from other military branches, the Air Force, Navy, and Marines, as well as British and Canadian military personnel. Since the military's missile program was still in the development stage during the late 1940s, there was very little missile hardware or equipment on which to do hands-on training. Instead, the curriculum was

centered on a class entitled the "Officer's Guided Missile Course," which consisted of thirty-four weeks of classroom training emphasizing guided missile theory and design. In 1951, three years after the training began, the 1st Guided Missile Group successfully fired a LARK missile, one of the earliest of Surface-to-Air Missiles (SAMs).

Once the Nike Ajax missile was approved for military deployment, guided missile training at Fort Bliss accelerated with breakneck speed. During the same time period, the United States' first guided missile approved to carry a nuclear warhead, the

MGM-5 Corporal tactical missile was also under development at the Jet Propulsion Laboratory (JPL) at the California Institute of Technology and at White Sands Missile Range (then White Sands Proving Ground, or WSPG) in New Mexico. The Corporal tactical missile was the first guided missile to be deployed for use with a nuclear warhead and grew directly out of earlier rocket programs

such as the Private F, an experimental rocket dating to 1945. In 1951 the Corporal was also the first missile to have a training program established specifically for its deployment. Although the Corporal was ultimately scrapped as an unreliable nuclear weapons delivery vehicle, it proceeded through several generations of development from 1945 until 1964, when it was finally phased out. In 1952, Corporal, which is now remembered as a nuclear weapon intended for tactical battlefield deployment, was briefly considered by the JPL (which had developed the Corporal) for use as an anti-aircraft missile.

In 1952, a combined Nike/Corporal missile training program was initiated that included not only a general, non-technical twelve week officer's training

(Clockwise from Top Left) Nike Hercules Class at Fort Bliss, Undated; Nike Classroom, Building 769, Fort Bliss, April 1961; Students Receiving Acquisition Radar Instruction, August, 1967

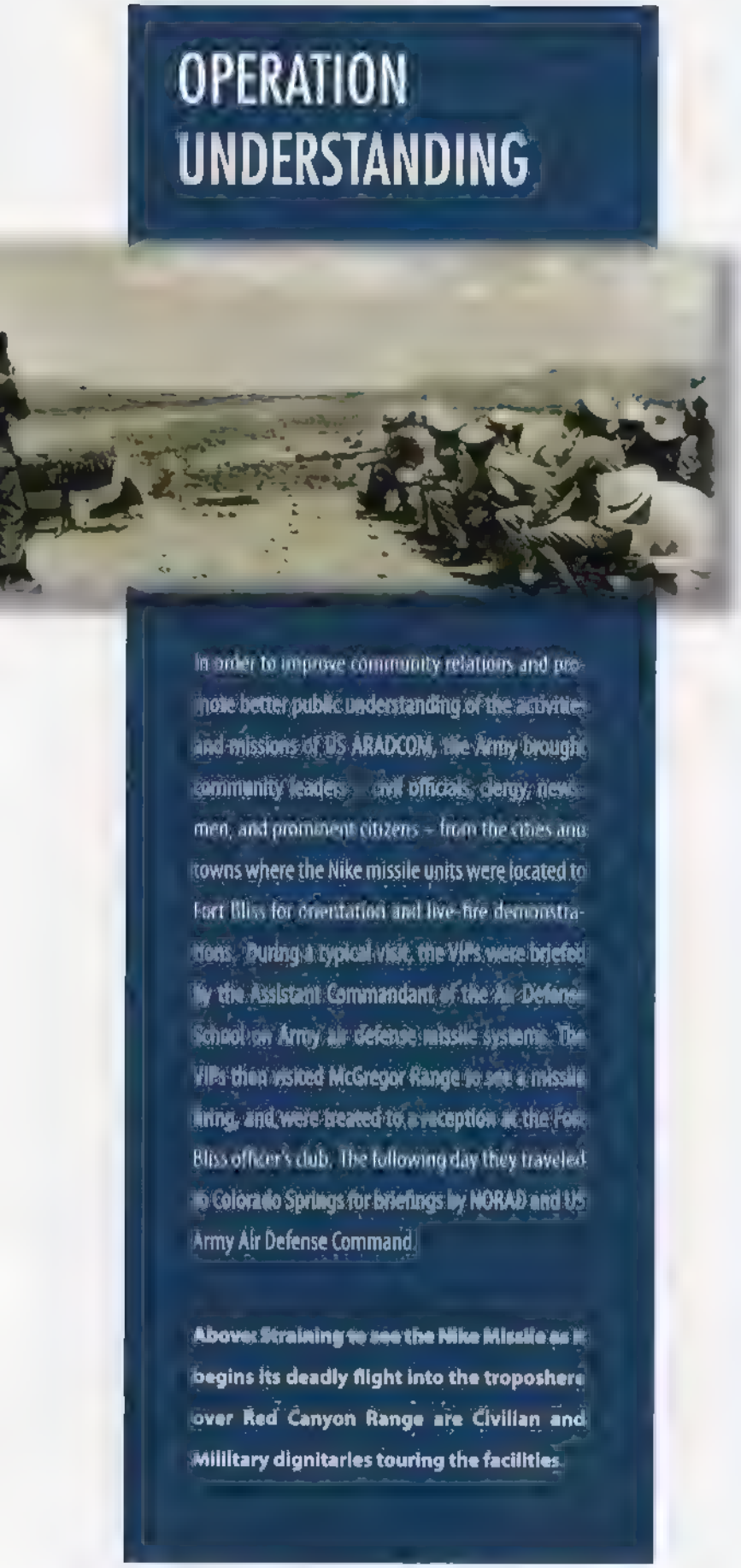
course, but more importantly technical courses for warrant officers and enlisted personnel on general electrical maintenance, lasting twenty-eight weeks, followed by a course on missile electrical systems for either the Nike or Corporal missile. The curriculum also included a nine week course on mechanical material that emphasized the maintenance and repair of either the Nike or Corporal propulsion system. Finally, in anticipation of establishing a comprehensive defensive perimeter of Nike missile units across the United States, the school offered a four week officer's course specifically on the Nike missile defense system. A combined Nike-Corporal missile training program was also initiated in 1952 at Redstone Arsenal in Alabama, the first missile training program at that facility, and consisted of officer training.

The new level of training required for this degree of sophisticated electronic technology was also emphasized by the formation of a Department of Electronics (later renamed the Department of Electronics and Engineering) at Fort Bliss. This upgraded the basic guided missile electronics course to an eight month session on the maintenance and repair of electronic components that comprised the ground guidance systems for either the Nike or Corporal missile. This advanced course was offered to selected warrant officers and enlisted men with prior experience in electronics or a college based education in the subject.

By 1953, the concept of "package training" was set up for the Nike program. Each Nike "package" consisted of the fourteen officers and 123 enlisted men that would make up a Nike Battalion. The concept centered on the idea that the men would train as a team from the battalion's inception until its graduation. Enlisted men and non-commissioned officers learned specialized skills in the classroom and laboratories at both the Guided Missile School and the AAA, while the unit officers learned not only the general principles of the missile system, but also how to command the unit and how it played a role in the overall defense network. The specialized curriculum included:

- Labs that utilized the latest in electronic equipment and featured instructors from the Philco Corporation, with the goal of learning the operation of the missile's electronic "brain" that featured more than one and one-half million components;
- An advanced radio and radar electronics course, including 288 hours on the missile's computer to learn the operation of the system's target and missile-tracking devices;
- Mechanical maintenance courses on missile propulsion, hydraulics, guidance systems and components that related to missile assembly, fueling and testing; and
- Courses for support troops that prepared them for jobs as assembly crewmen, launcher crewmen, radar or computer operators. This classroom phase of the package training lasted forty three weeks.

Once the classroom and laboratory work was complete, it was time to put theory into action with range training. Nike Battalions practiced numerous assembly and launch drills in the field, first at the Red Canyon Range near Carrizozo, New Mexico, and later at the McGregor Range near Alamogordo. The goal of the range training was to have each newly trained unit fire a Nike missile and destroy an airborne drone in the form of a radio-controlled aerial target (RCAT).

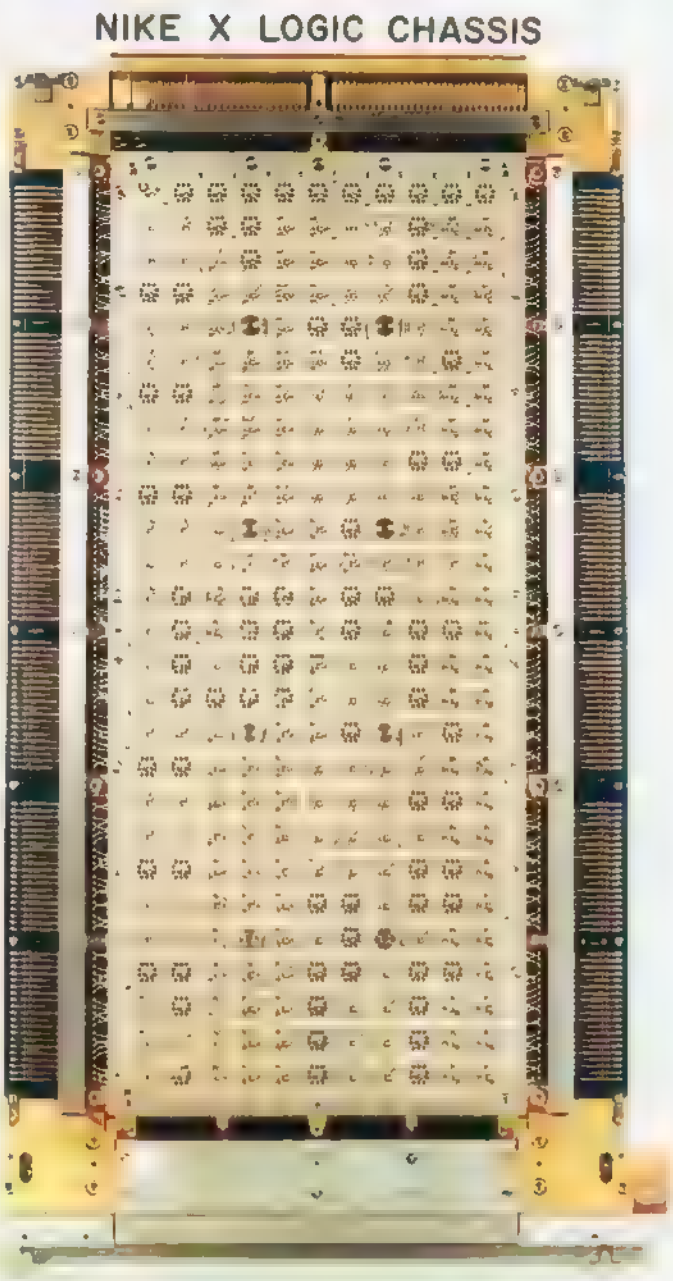


The training was timed so that everyone completed their specific courses on the same date and was ready to move into the field as a fully-trained, field-ready unit. The 2nd Guided Missile Battalion was formed in October of 1952 to organize and train Nike missile packages. A month later, the 1st Guided Missile Brigade was activated to develop missile doctrine and procedures and oversee Nike range testing at the Red Canyon Range. On October 28, 1953, Package Number 2 of the First2First Guided Missile Brigade was the first troop unit to successfully fire a Nike Ajax missile and knock down its intended target. Over the next four years, 200 Nike Ajax batteries were certified as ready for permanent assignment in the field.

Throughout the remainder of the 1950s, the Nike training program (together with other surface-to-air guided missile programs, such as HAWK) continued to increase enrollment and expand the number of courses offered. In 1956, the United States Army Anti-aircraft Artillery and Guided Missile Center was renamed the United States Army Air Defense Center. Concurrently, the Anti-aircraft Artillery and Guided Missile School was renamed the United States Army Air Defense School. That same year, the school offered twenty-one courses and trained 300 officers and 800 enlisted men. Also in 1956, all training for surface-to-surface missiles, such as the Corporal and Loon (the JB-2, a U.S. copy of the German V-1), was transferred to Fort Sill, Oklahoma.

In 1957, the number of Nike trainees increased to 1,300 men, and on the fifth of April the first Nike missile was fired on the newly opened McGregor Range. In addition to newly-trained units using the McGregor

(Top) Testing on a Target Tracking Radar Console. (Below) The Nike Missle Defense System Required Training in the New Field of Computer Technology.



Range, previously trained units began returning to Fort Bliss for their annual service practice, which was carried out on the Red Canyon Range. Also in 1957, the new Nike packages were issued their own equipment that then stayed with them as they were transferred to their field assignments.

Beginning in 1958, the Department of Guided Missiles reorganized into six sections, in part based on the altitude capabilities of the missile system:

- The High Altitude Missile Department that trained crews for Nike Hercules;
- The Medium Altitude Missile Department for Nike Ajax training; and
- The Low Altitude Missile Department for training in the technical aspects and maintenance of the HAWK system and antiaircraft guns.

The remaining three sections in the newly reorganized department included: Command and Staff; Electronics and Engineering; and Non-resident Instruction. The number of courses offered more than doubled to fifty-three, which lasted from one week to sixty-eight weeks.

By the end of the decade, the Air Defense School had tripled in size and classroom facilities were utilized twenty hours per day with classes starting at

0500 hours and ending with a class that started at 2330 hours. In March of 1958, the 1st Guided Missile Brigade and the 1st Guided Missile Battalion (the latter activated in June of 1957) began a new series of training courses on the conversion from Nike Ajax to Nike Hercules, as this next generation in the Nike weapon system came into use. The first troop firing of the "Hare" was accomplished in April of that year. In June of 1959, the Red Canyon Range was closed and all field training for missile battalions was moved to the McGregor Range. In addition to regular Army troops being trained on the Nike system, instruction was expanded to include National Guard and Army Reserve troops as well. The 2nd Guided Missile Group and the 4th Guided Missile Battalion, activated in November of 1952 and December of 1957 respectively, were responsible for training the National Guard units. The first National Guard unit to train with the Nike Ajax was the 720th Battalion from California.

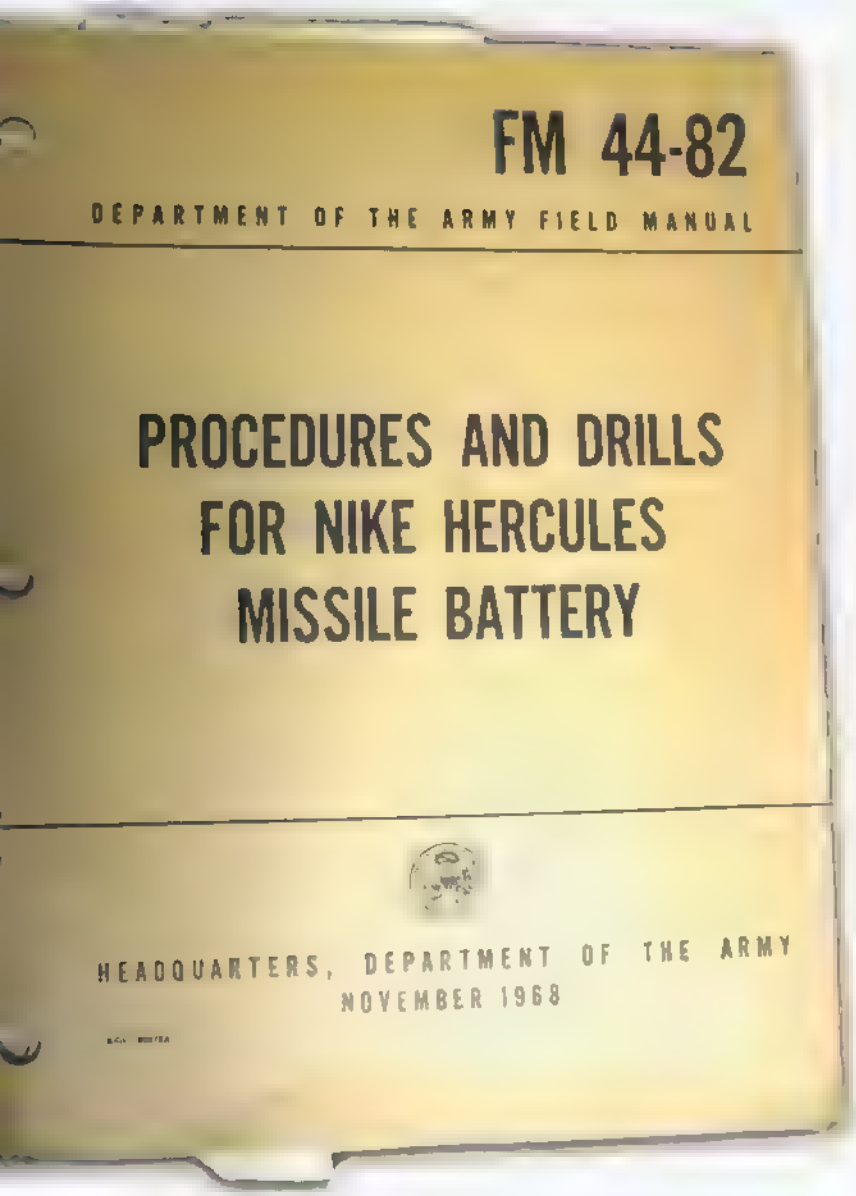
In 1964, Nike missile training reached its apex at Fort Bliss with 8,000 graduates coming out of the school. For the rest of the decade, the number of trainees leveled off to approximately 4,000 to 6,000 men being trained per year. In the 1970s, the number of trainees was reduced to about 3,500 per year as new activations in the guided missile defense system leveled off and the Nike weapon system was cut back nationwide.

The number of courses offered reached an all-time high in 1967 when seventy-one were offered – this despite the fact that Nike Ajax courses for regular Army trainees had been deleted from the curriculum in 1964 and National Guard units were now being trained at the school to convert from Nike Ajax to the Hercules system. In the late 1960s, the number of courses dropped to an average of sixty-five per year. By the 1970s, more and more courses were being offered through the Army's non-resident program.

In July of 1964, the Air Defense School underwent a reorganization with a Director of Instruction replacing a Deputy of Instruction and the creation of a Directorate of Doctrine and Training Literature (its name was changed in 1968 to Office of Doctrine Development, Literature and Plans). In 1965, the Electronics Department was redesignated the "Missile Electronics and Fire Distribution Systems Department," which was thought to better describe the complex type of equipment involved in the training program (its name was changed again in 1970 to the "Missile Electronics and Control Systems Department"). With the development of the third generation of Nike missile – the Nike X – the Army established the Nike X Centralized Training Directorate in 1966. This group was responsible for monitoring the development of this missile and planning the anticipated training program once it became operational. This directorate was replaced a year later by the Sentinel training facility when this weapon replaced the Nike X and was renamed the SAFEGUARD Central Training Facility in 1969. Unlike Nike X and Sentinel, which were never actively deployed, SAFEGUARD did briefly become operational in 1975, but for political and budgetary reasons it was inactivated that same year after a very brief period of deployment, officially signaling the end of the Nike era for the United States armed forces.

Typical Nike Classroom Activities in the 1950s and 60s.

Training after the mid-1970s under the Nike program continued only for international military personnel from United States-allied nations (such as those in the North Atlantic Treaty Organization, or NATO) that continued to use Nike systems after they had been inactivated for use by the United States armed forces. Although Air Defense Artillery training continued at Fort Bliss for both United States and international military personnel, Nike systems had by the late 1980s largely been phased out internationally as well, and thereafter training concentrated on newer air defense missile systems, such as the Patriot. In 2005, the Base Realignment and Closure (BRAC) 2005 Commission recommended the relocation of all Army artillery training to Fort Sill, Oklahoma.



COURSE CURRICULA

Personnel were selected for Nike missile training based partly on aptitude tests, which emphasized potential trainees' abilities in arithmetic, electronics, and mechanics. Once in the training program, they would acquire skills in electronics, launch procedures, generator repair, and, in the case of firing-control officer trainees, supervisory expertise. A ten percent attrition or "wash-out" rate at the ADA School was compensated for in each package's training by ensuring that a surplus of men was trained simultaneously; this was done so that no missile package would end up short of their full complement of officers and enlisted men upon graduation.

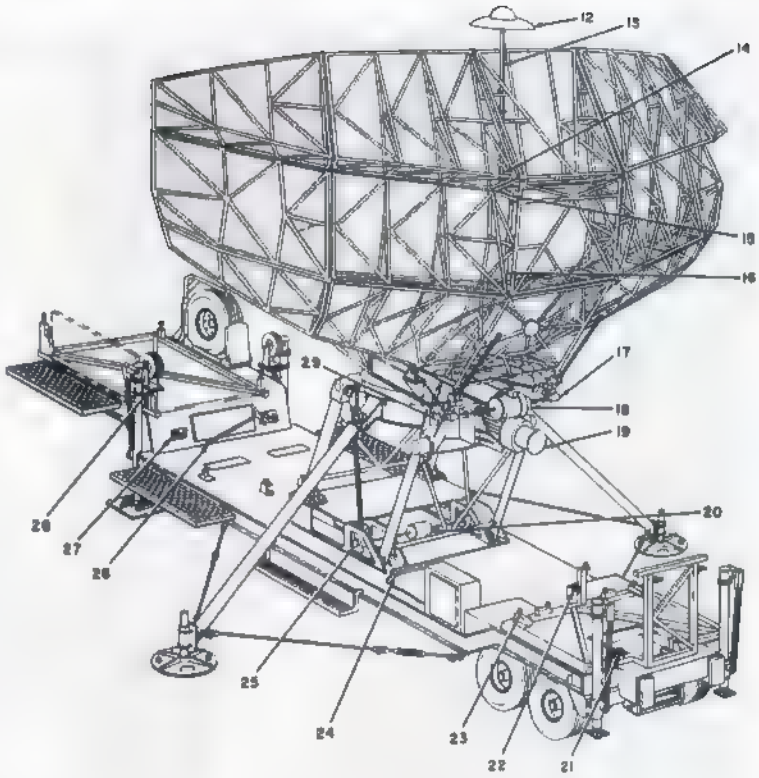
RESIDENT INSTRUCTION PROGRAM

Courses in the Resident Instruction program – the program for regular Army trainees, rather than for National Guard and Army Reserve members, who took Army extension courses to stay abreast of developments in missile technology – were the main focus of the Fort Bliss ADA School. In 1960, when both the Nike Ajax and the newer Nike Hercules systems were being taught at the school, there were three categories of resident instruction courses: technician, orientation, and supervisory courses. Only officers attended all three categories of classes; warrant officers (who are senior-grade military "specialist" or technical officers) and enlisted men took technician courses.

A sampling of courses offered in these three categories gives some idea of the concentrations of time and technical training that missile personnel undertook to complete their schooling. Technician courses included a six-week long, four-day-per-week class, on "Nike Ajax Missile Mechanical Materiel Maintenance" (44-R-172.1). The course description in the 1960 U.S. Army Air Defense Digest published by the U.S. Army Air Defense School, Fort Bliss, stipulated that this course:

> *Trains enlisted personnel to assemble, install, maintain, and adjust Nike Ajax mechanical and hydraulic on-missile guidance control systems and associated test equipment; and to assemble missiles and perform required checks on Nike Ajax propulsion and mechanical systems.*

The "MOS," or the "military occupational skills" category for trainees in this course, was "AD [Air Defense] Missile Materiel Mechanic."

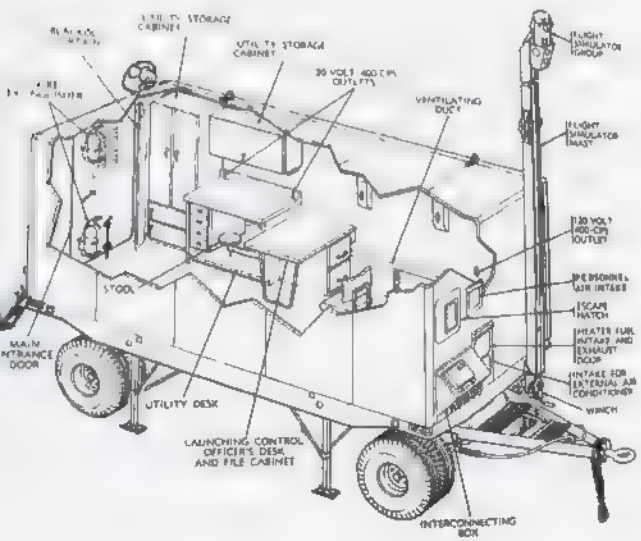


Another course offered in the same year, "Nike Hercules Missile Mechanical Materiel Maintenance Transition" (44-R-178.1T), offered "transitional" training for the same MOS to Ajax-proficient missile mechanics so that they could learn the Hercules system, which was in the process of replacing the Ajax system at installations around the country.

Other "technician" courses included "Defense Acquisition Radar Maintenance" (44-R-229.1), an eighteen-week, two-day-per-week course that "Trains enlisted personnel to employ, adjust, and maintain air defense acquisition radars AN/TPS-1G, AN/FPS-36, and associated IFF equipment." This course was for Defense Acquisition Radar Mechanics.

There was also a group of courses specifically for the personnel who would be involved in the maintenance and operation of the Radio Controlled Aerial Targets (RCATs) – the Army's airborne target drones that were used for missile practice at the ranges.

Purportedly the most difficult course of all was the course for the "Guided Missile Systems Officer" (44-A-1181) – a thirty-eight week course in the "physical sciences applied to guided missiles, and the theoretical and practical aspects applicable to all types of guided missile systems to prepare [officers] for duties involving research and development, testing, analysis, and military applications of guided missile systems."



"Orientation" courses were courses for officers who wanted to learn about various missile systems and how they fit within the command structure. For example, there was a course on "NORAD Senior Officer Orientation" (44-A-F23), a four-day class for "general officers, flag officers, and field grade officers assigned to the North American Air Defense Command" to provide them with a "general knowledge of the Army air defense systems deployed in CONUS [the CONtinental United States]." There was also a course for "Modern Weapons Familiarization" (44-G-F1) for "senior Allied Officers" so that they could learn about "modern weapon systems, tactics, nuclear weapon employment, and modern organization concepts." Another orientation course was on "Nuclear Weapons – Guided Missile Orientation" (44-G-1), which was one week in length.

"Supervisory Courses" were for commissioned officer training. "Air Defense Missile Officer Basic" (44-A-C1B) was an eight-week long course for newly commissioned officers on "their duties and responsibilities as a platoon officer" in a Nike battery. Another course, "Nike Hercules Officer Transition" (44-A-F7) gave officers "Nike Hercules transition training so that they will have a working knowledge of battery operations, tests, and inspections required to determine effectiveness of personnel and equipment."

John W. Brown, Jr., of Delanson, New York, trained in the ADA School program from June of 1968 to February of 1969, in the Nike Hercules Electronic Maintenance program. He recalled the courses he took and the number of hours required:

COURSE TITLE	No. of Hours
Basic Electricity	130
Basic Electronics	175
Nike Hercules Assembly	265
Warheads, Assembly and Service Operations	65
Launching Area	252
Equipment Orientation	7

Brown recollects that the training also included review of standard Army training such as "the Geneva Convention and Security, etc." In addition, he was taken out to McGregor Range to observe what was called "Short Notice Annual Practice" (SNAP) for members of active missile sites who practiced "assembling and firing live missiles," he said. "We just watched."

Brown remembered that the Electronic Maintenance program was "mentally challenging as there was a lot to remember and the testing could be difficult...We were allowed to use all the schematics and info from our classroom studies, but you still had to develop the logic to isolate problems which was a combination of understanding the interaction of components and reams of schematics." He scored consistently in the 90s in a 100-point grading system, and believes he was a little better prepared than other students in the program for its rigors because of his prior electrical knowledge from previous college training.

RESERVE PROGRAMS AND NONRESIDENT INSTRUCTION

The purpose of United States Army Reserve (USAR) officer training was to "provide a realistic military educational program for officers not on active duty." It provided the same training in a three-year time period for non-active officers that active officers in the Resident program received in less than a year's time.

There was also a Non-Resident Instruction program provided for National Guard and reserve officers not on active duty, to allow them a way to "keep abreast of developments and current doctrine" in Air Defense. This extension program, as it was called, was based out of Fort Sill, Oklahoma.

In support of its educational missions, the Air Defense School also produced dozens of Air Defense training and technical manuals and training films. These were constantly undergoing updates to keep pace with developments and changes in both air defense technology and in training doctrine.

ALLIED NATIONS NIKE TRAINING

The Army formed the Allied Student Battalion to handle the training of these foreign students, both officers and enlisted men, which was tasked with the mission of not only learning how to successfully operate the Nike weapons system, but also responsible for providing these students with an understanding of the American way of life – a key, somewhat subliminal, component in the battle against Communist ideology. This was done through entertainment, athletics, and cultural programs. A major part of this program was dedicated to having the trainees (and their families) become fluent in the English language. A Language Enhancement section within the Battalion was created in 1965 to meet this goal and within the year, more than 10,870 hours of instruction in Basic English were given in thirteen different languages.

In 1963, the Allied Student Battalion and the El Paso Council for International Visitors set up the Host Family Program for foreign trainees. This voluntary program offered students an opportunity to live with a host family and thus become more integrated into the American lifestyle. By the end of the decade more than 3,800 Allied students and 1,500 dependents had been sponsored by host families living in the El Paso area. Overall, in the twenty year period between 1953 and 1973, 16,385 Allied students from 53 countries were trained at Fort Bliss on the Nike weapons system, aided by supplementary programs such as the Host Family Program, English language training, and the recreational activities program.

NATO Officers Observe a Typical Class on the use of the Nike-Hercules System, May 5, 1966.

Building 645 (Originally Cavalry Stables) was used for Missile Fueling Exercise during the 1950s. Today (Above) the Building has been Converted into Office Space.

TRAINING BUILDINGS

During its thirty years of actively training U.S. Army personnel on the Nike weapons system at Fort Bliss, the Air Defense School and the Department of Guided Missiles has been housed in a number of buildings on the post. Some were retrofitted to accommodate the new training, while others were newly built to specifications designed exclusively for Nike training. The Department of Guided Missiles was initially headquartered in Building 515; however, by 1950 an additional five buildings located in the 500 Area were taken over by the department as research and development of the guided missile program gained momentum. To accommodate the needs for increased training, classrooms located in the western half of Brady Hall (Building 512) were used.

As one would expect, the tremendous increase in training at the post from 1946 to 1966 resulted in a virtual building boom. In 1946 there were 645 buildings on the post, but by 1966 this number had increased to more than 3,700 with new buildings constructed to accommodate not only classrooms and labs, but administration, housing and support services as well. As early as 1952, $20.5 million worth of new buildings and structures were either completed or under construction.

As Nike weapon systems became ready for deployment, missile launchers, portable control buildings, radar installations, and the actual missiles themselves became an integral part of the training regime for both Nike Ajax and Nike Hercules. In May 1951, thirty-two Butler-type sheet metal buildings were constructed in Area 2300 for use as hands-on classrooms and missile shops. Twenty-eight of the buildings (numbers 2320, 2321, 2326, 2327, 2330-2337, 2340-2347, 2350-2357) were identical, 7,025 square-foot, one-story prefabricated structures, featuring a poured concrete foundation, corrugated metal walls, and a pitched metal seamed roof. Entry was through two horizontal sliding full-height double-leaf doors and several single metal doors. Four of the Area 2300 buildings (numbers 2322-2325) were larger in size (9,835 square feet) and featured a rectangular plan high-bay and an attached one-story office area, which flanked a long side of the building and had a shed rather than pitched roof. All buildings featured gas-fired heating units and evaporative coolers. These thirty-two buildings were organized into eight 4-building blocks, numbered consecutively from south to north. The area also contained a small prefabricated guard house (2319), and two small sheet-metal Butler buildings used as guard shelters (2328, 2338).

In a touch of architectural irony, these very unadorned, very utilitarian buildings were designed by the renowned architectural-engineering firm of Meem, Zehner, Holien & Associates of Santa Fe, New Mexico, and the as-built drawings were personally signed by John Gaw Meem, arguably the most celebrated architect of Southwest regional revivalism. Like many other architectural firms, Meem, Zehner, Holien & Associates had acquired government contracts during World War II to design military related facilities to offset the drastic cutback in residential and commercial designs during the war. The building project at Fort Bliss Area 2300, completed under contract with the U.S. Army Corps of Engineers, Albuquerque District Office, was obviously a holdover from this era. It is somewhat surprising, however, that the plans are signed by Meem himself for by this time in his career he delegated work on all but the most important projects to his staff. The fact that Meem, creator of the distinctive Spanish-Pueblo Revival and Territorial Revival architectural styles, signed off on these ordinary structures shows the extent of his involvement in all aspects of his firm's work.

In 1953, the department was moved to a specially-constructed lab (Building 60). A year later, Hinmann Hall (Building 2) was constructed as a multi-purpose facility with classroom and laboratory space for 5,000 students, a 1,200 seat auditorium, and administrative office space. Perhaps the most notable building related to Nike training was Building 769, built in 1939, that enclosed a complete mock Nike missile battery and had room for 200 trainees to observe and participate in exercises pertaining to how such a battery actually operated. A new Radar Park was finished in 1959, which covered more than four football fields in size and cost $1.8 million.

Area 2300 was used as the main hands-on Nike training area until 1960 when a new classroom and lab building was constructed. In 1962, most of the buildings in Area 2300 were converted to maintenance and assembly shops; however, periodically throughout the 1960s the 4th Missile Battalion, 62nd Artillery, continued to use buildings 2330, 2340, 2341, 2350, and 2351 for Nike Hercules training. By 1968, all Nike training activities had vacated the area and the buildings were used for general applied instruction, and in1993 they were converted into maintenance shops.

DRAWING OF WORK AS BUILT

REVISION	DATE	DESCRIPTION	BY	BY

MEEM, ZEHNER, HOLIEN & ASSOCIATES
ARCHITECTS–ENGINEERS
SANTA FE NEW MEXICO

CORPS OF ENGINEERS, U.S. ARMY
OFFICE OF THE DISTRICT ENGINEER
ALBUQUERQUE, NEW MEXICO

DRAWN BY: SJH
TRACED BY: SJH
CHECKED BY: SSD
PREPARED: Architect–Engineer
SUBMITTED: Chief, Military Works Branch
RECOMMENDED: Chief, Engineering Division
APPROVED: Colonel, Corps of Engineers, District Engineer
DATE: May 1961

FORT BLISS, TEXAS
AFF BOARD NUMBER 4 & G.M. CENTER
1ST G.M. GROUP TRAINING FACILITIES
SERVICE BATTERY TRAINING BUILDING
ARCHITECTURAL
ELEVATIONS & SECTIONS

SCALE: AS SHOWN
INV. SERIAL NO. ENG. 29-005-51-34
DRAWING NUMBER 60-08-01
PLATE 11
SHEET 6 OF 6

RADIO-CONTROLLED AERIAL TARGETS (RCATS)

From the inception of field training for Nike missile systems, a major question facing the guided missile trainers at Fort Bliss was what kind of target would the Nike missileers shoot down? Sending up full-scale, remote-controlled aircraft over the test ranges was technologically difficult and very expensive, and the dangers posed to a conventional, manned aircraft towing a target were too great. Instead the Army devised a small, radio-controlled aerial target (RCAT), which was relatively inexpensive, had good maneuverability, and when fitted with reflector pods on its wingtips could produce the same radar cross-section as a full-scale airplane. The RCAT was approximately ten feet long, with a wingspan of twelve feet. It was powered by a four-cylinder, air-cooled, 72 horsepower engine that drove a single, four-foot long propeller, and was equipped with a parachute in the aft portion of its fuselage to facilitate a soft landing. Each drone cost $2,500.00.

RCATs were launched towards one of the three test ranges – Red Canyon, McGregor, and White Sands – from the Oscura Range Camp located at the remote northern end of the White Sands Proving Ground. This small range camp, manned by a staff of fifty Army regulars, consisted of a small cluster of wooden buildings, a circular RCAT launching track, and two M-33 mobile radar units. The RCAT was painted a bright red to facilitate in-flight photography and to aid in its recovery following the test. The drone was launched from a wheeled rack attached to a cable that was anchored in the middle of a circular track.

(Left and Below) Readying RCAT for Flight. (Opposite Lower Left) Preparing for Jet Assisted Take Off (JATO). (Opposite Center Right) RCAT JATO Launch Rail.

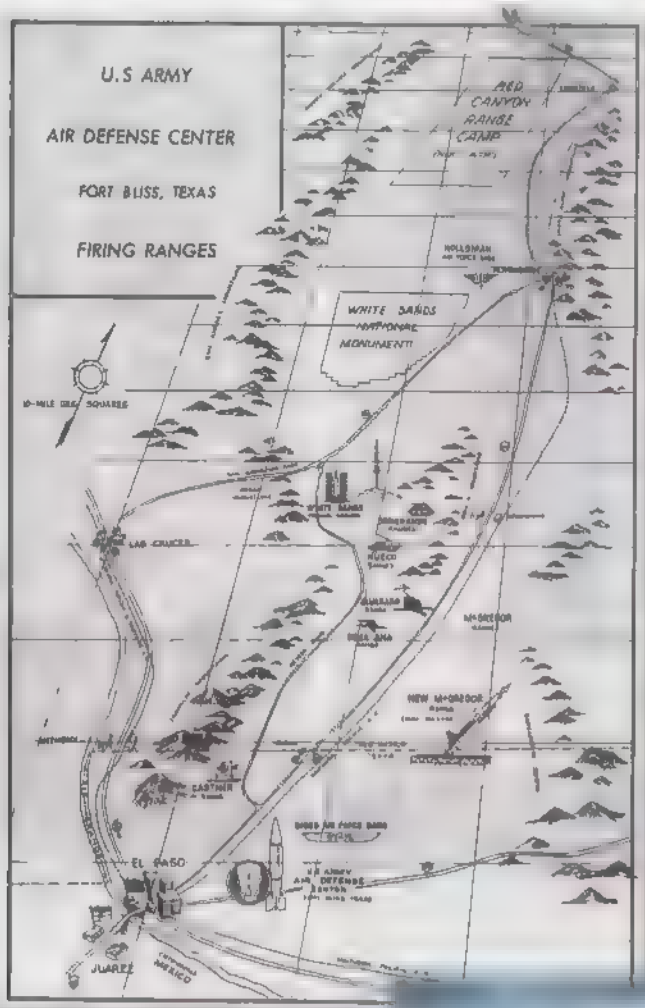
225 miles per hour

[T]he Recovery Team would load some cold beer in the back of a 5 ton truck and go roaring off through the desert sage brush and try to find it [the RCAT]. They were gone most of the day, recovery or not. Most of the drones that were found had been stripped by the locals. I think every ranch in that part of New Mexico had a prop with a clock in the middle hanging over the fireplace.

In addition to the "locals" scavenging for RCAT souvenirs, the recovery teams also faced competition from the participating missile batteries who, upon successfully intercepting a missile, would go out searching for "hunting trophies" (the drone's propeller, or parts of the wing or fuselage) to bring back home to their operational sites to hang on the walls of their recreation rooms.

TEST RANGES: WHITE SANDS RED CANYON, AND McGREGOR

Integral to the successful Nike missile training program were the nearby test ranges located north of Fort Bliss in the barren Tularosa Basin situated in southern New Mexico. Nike missiles were fired at three different ranges during the three decades that the program was in operation.



WHITE SANDS MISSILE RANGE

[illegible] Defense resource [illegible]

RED CANYON RANGE

One of the most memorable places during the Nike years at Fort Bliss was the Red Canyon Range, which was located just west of the small New Mexico town of Carrizozo, 165 long miles from El Paso. The remote Red Canyon Range Camp, in use between October 1953 and August 1959, was situated on a broad expanse of desert landscape punctuated by numerous species of cactus, greasewood bushes, and the solidified ancient flows of black lava rock locally known as the Malpais (Spanish for "badland"). The camp became "home" for the early guided missile groups helping to develop our nation's new defense weapons. Among the men who were posted there, the camp's remoteness, along with a shared belief in a common purpose, helped ingrain within them a unique sense of place as well as indelible memories that have lasted long beyond their tour of duty.

The camp was used for the initial training of Nike personnel, and it also hosted men from Nike batteries located across the country who came to the Red Canyon Range for their annual service practice (ASP) firing. During its six years of operation, more than 3,000 Nike Ajax missile launchings were witnessed not only by the 300 troops permanently stationed there, but also by more than 10,000 visitors from forty states and forty-five foreign countries.

For annual service practice, a Launcher Section crew from a Nike Battery was flown from their operational site to Fort Bliss a week ahead of the training exercise to assemble the three missiles that would be fired during the exercises. Army personnel permanently assigned to the Red Canyon Range Camp provided support as necessary to these crews; however, it was understood that the units were being evaluated and scored for their proficiency so this support was limited in scope. The remaining members of the battery arrived at camp the following Monday, finished on-site preparations, and launched two of the missiles on Wednesday afternoon and a third on Wednesday night. After a debriefing on Thursday, the battery returned to their operational unit on Friday. The "Desert Rats" (those troops permanently assigned to the range camp) then readied themselves for the next group of fresh troops and dignitaries who arrived from such "civilized" locales as the environs around New York City, Washington D.C., Chicago, or San Francisco to spend a week "out in the middle of nowhere" avoiding rattlesnakes, scorpions, and wayward RCATS.

MCGREGOR RANGE

In 1959, all Nike training and annual service practices were moved to the McGregor Range Complex that straddles the New Mexico – Texas border and abuts the northern boundaries of Fort Bliss. The range included the McGregor Complex, the Meyer Range Complex, the SHORAD Range, the Orogrande Range, the Dona Ana Ranges, and other training areas. It supported two base camps, McGregor and Orogrande, that could temporarily feed and house over 1,500 personnel combined. Situated on almost 700,000 acres of Army-owned and withdrawn public land, the range had twenty-six air defense missile firing sites and hosted multi-national joint training exercises (JTE) such as the annual Roving Sands JTE. For over twenty-five years it supported the Nike missile program by training not only Army and National Guard Nike batteries, but personnel from allied nations who acquired these weapon systems for defense of their own countries. The Nike facilities at McGregor Range are no longer extant.

LIFE OUTSIDE THE CLASSROOM

Soldiers assigned to the guided missile school at Fort Bliss were faced with an intense and often complex curriculum to prepare them for manning a Nike missile battery. They spent at least forty hours per week either in class or performing hands-on training with the missiles, radars, and other ancillary equipment, and due to the number of trainees and limited classroom space, these classes were held at all hours of the day including the evening hours. In addition, the trainees still had other soldierly duties to attend to such as Saturday inspections, KP assignment, and sentry duty.

As several former soldier-trainees who were interviewed for this history project can attest, life was not all work and no play. Once a trainee was issued a Class A Pass — called by one young soldier "the best [illegible]" — there was a number of on and off-post activities to occupy his time. For many, training at Fort Bliss was their first experience away from home, and often their first experience in the desert Southwest which in itself offered many new sights and experiences.

According to former trainees and soldiers stationed at Fort Bliss, recreational opportunities on the post in the 1950s and 60s were somewhat limited. Gordon Lunn, who trained at Fort Bliss to be a battery officer, did not recall the base itself as holding many entertainment options for soldiers during off-duty hours. "The Officers Club was not a real attraction," Lunn said. "Except for the swimming pool, which was crowded with dependents. I don't recall the post library or the El Paso library being particularly useful. I went to the movie theater a few times."

Tom Lundregan, who trained at Fort Bliss from May 1954 to April 1955 as a Nike Fire Control operator, recalls that there were sometimes course handouts that the trainees were supposed to familiarize themselves with before a class, but he does not remember there being a lot of homework that he had to complete. "There wasn't a lot of bookwork per se while you were in training," Lundregan said. "So there was time for social activities. You pretty much hung around with your buddies during off-duty hours," Lundregan said.

On the other hand, some trainees appreciated the on-post facilities, especially considering the pay they were earning. Timothy Smith, a trainee who attended the school as a Hercules missile crewman for [illegible] weeks in September 1960, remembers: "It was great to be able to go to the PX, the gym, or to the soldier's clubs. I also went to town a couple of times, but it was pretty expensive, considering a private's income."

Some soldiers ventured on sightseeing trips to White Sands and Alamogordo, or hiked the nearby mountains. However, for most soldiers the real off-duty "action" was in El Paso or across the border in Ciudad Juarez. The most common problem was how to get there. Ron Pickenpaugh, who trained as a Nike control panel operator from July of 1953 to April of 1954, recalled that for many of the young trainees, getting

Nike trainee Norm Whitten (left) and Friend Set-up a HAM Radio Station (W7DMU) in their Barracks (Building 515), January 1958.

off the post could be a challenge in itself. "The post was located a ways out there in those days," he said. "You either had to have a car or know someone who owned a car if you wanted to do any traveling around the area."

El Paso offered shops featuring Mexican handicrafts and movie theaters that offered first-run films. One place frequently mentioned by the interviewees was Alligator Park, located in San Jacinto Plaza, near the center of El Paso. It held live alligators from time to time between the 1880s and the 1960s, when vandalism made it impossible to keep them there any longer. But the servicemen from the nearby post enjoyed going there to look at the big reptiles, and to socialize.

When they tired of El Paso, the soldiers from Fort Bliss could cross the International Bridge into Juarez, Mexico for a different kind of fun and excitement. Norman C. Whitten trained as a radar operator at the missile school in 1957-1958 and worked for eleven months at Red Canyon and McGregor Ranges. One of the first things Norm did was to cross over the Rio Grande, which he described as being "about the size of a mud puddle or small creek," and visit Ciudad Juarez. The Mexican city offered new sights, sounds, and smells. While crossing the bridge, Whitten observed that:

> *[D]own on the bed of the 'at-times-large' river were little boys with paper and cardboard shaped to form cones, begging for the tourists to throw them money which they would try to catch in the cones. In Juarez, the shopkeepers called for us to enter into their stores, the men and women of the stands selling rings, leatherwork, handiwork in silver, etc., beckoning us to buy presents and souvenirs of Mexico.*

[illegible] Plaza) in downtown El Paso, seen here in 1910, was still a popular hang-out in the 1950s and 60s until the reptiles were moved to the city's zoo in 1967

Many trainees also got their first look at the traditional sport of bullfighting while visiting Juarez. Again, Norm Whitten recalls:

Jack Terhune ... and I had nothing to do so decided to come into [El Paso] and hang around Alligator Park. After talking a while we decided to see a bullfight, since Jack was almost finished with ... school and had not seen one yet. After looking all over Juarez for a ring we finally found one, paid our admission, and sat down to watch the show. ... It was a warm, sunshiny day, and when the matadors, picadors, etc. came in, the arena was in a maze of colors. (There were six fights that day.) The first matador was on horseback for the first part. Then he showed his skill on foot. Finally he [got] ready for the kill. The bull was stopped, [the matador] took sword in hand and lunged, plunging it to the hilts into the bull...The dam bull stood there, looking dazed, took a few steps ... and collapsed. It was all very interesting to watch, but I'll take a football game any day.

Many years later, Norm Whitten remembered Juarez as "one of the places soldiers would head to but usually not write home about [but] there were also some very fine restaurants a solder could infrequently afford; one of which had a wonderful swimming pool, and there was cheap bowling [at] a bowling alley on the Pan American Highway."

Some soldiers in the guided missile school were older and brought their families with them to Fort Bliss. John Brown, Jr. was posted after his training to a Connecticut National Guard Nike installation as a member of an Active Army Custodial Team (these were regular Army units stationed at National Guard Nike installations that were in charge of nuclear warheads on site.) Brown attended the missile school for eight months, from June 1968 to February 1969, graduating with top honors. During his Fort Bliss training, he lived off-post in El Paso with his wife in a converted garage apartment off of Alabama Street. Brown recalled the atmosphere of mutual support that existed in their neighborhood.

An Army drill sergeant and his wife rented the house on the front of the property and we became friends. The neighborhood was largely friendly Mexican-Americans, and some military personnel. A grocery market across the street from our 'garage' regularly accepted our out of state checks and frequently helped my wife back across the street with groceries.

Brown also recalled that on his meager Army pay, he and his wife did not have much money left over after groceries and rent, but they still managed to enjoy themselves. He fondly remembered going to parties hosted by friendly National Guard missile school trainees, visiting White Sands and Juarez, and "hanging around with friends and playing board games." As a family man, Brown says he stayed away from the kind of trouble that he saw the young "single" trainees getting into – especially in Juarez.

Although the pay was not great, the recreational opportunities were somewhat limited, and the training was intense, to a man, almost everyone interviewed for this history mentioned that their times at Fort Bliss and in the service were among the happiest periods in their lives.

Norm Whitten and Classmates in Juarez, Mexico

THE LEGACY OF NIKE MISSILE PROGRAM

Training continued for Nike systems at Fort Bliss into the 1980s, since Nike Hercules and Ajax systems continued to be operated by nations allied to the United States long after they had been decommissioned for use by the United States military. The ADA School continued to train thousands of foreign nationals on the missile defense systems through the 1980s. Meanwhile, the United States military came to rely on the Patriot surface-to-air missile, which replaced the Hercules for medium-to-high altitude intercept missions, and the HAWK missile system for low altitude intercept missions.

While Ajax and Hercules installations in the United States were inactivated after the decline of the strategic bomber threat, Nike systems progressed through additional generations after the Hercules was deployed. Nike Zeus was a missile system designed to be an ABM (Anti-Ballistic Missile), or "anti-missile missile." It successfully intercepted an Atlas ICBM in July of 1962 over the Pacific Ocean, proving that such a system was effective. From the Nike Zeus program came the Nike X program, which became part of the only ABM system in the free world. The Nike X, as the system was called from 1963 to 1967, was part of an ensemble of two missiles: a Nike Zeus, a high-altitude anti-missile missile, and a Sprint missile, a short-range, very high speed missile interceptor.

The name of the Nike X program was changed to the Sentinel anti-ballistic missile system in 1967; this in turn was replaced in 1969 by the Safeguard missile. The only anti-ballistic missile system to be deployed for active service in the free world, the Safeguard missile system consisted of the Spartan (essentially a retooled Nike missile) and the Sprint. The Spartan was a high-altitude missile designed to intercept incoming ICBMs before they re-entered the atmosphere on their way to targets within the United States. Should the Spartan missile fail in its mission to bring down incoming missiles and warheads at long range, the Sprint was fired as a second line of defense, to bring down the ICBM at closer range. At the time of its development, the Sprint missile – which could travel at Mach 10 – was the fastest object built by man.

After many development delays, Safeguard was deployed briefly at the Stanley R. Mickelson Complex in Nekoma, North Dakota, in 1975 to defend United States Air Force Minuteman ICBM silos located near Grand Forks. It was shut down within 24 hours of its deployment by congressional action, a victim of budget considerations, politics, and admitted conceptual flaws that had led the Department of Defense to plan closure of the Safeguard facility by 1976. However, since the deployment of ABMs was viewed by both superpowers as an incitement to escalate the production of additional nuclear weapons to overwhelm defensive systems, Safeguard served as an added impetus for the U.S. and the Soviets to engage in anti-nuclear arms treaty talks, such as the SALT I (Strategic Arms Limitation Treaty) and SALT II negotiations.

Other missile systems filled the antiaircraft niches formerly occupied by Nike missile systems, including the Patriot missile, which is still active today. But for the Nike missile, an era had ended. It left behind a legacy of thousands of men and women who were trained in the various Nike programs at Fort Bliss.

The Cold War came to an effective end in 1991, with the collapse of the Soviet Union, but Nike missile sites had already long since been abandoned. At scattered locations around the United States, the remnants of some of the Nike missile sites can still be discerned, an additional legacy of the Cold War. Now the missiles, and the long-range bomber threat that they were designed to counteract, are only a historical memory.

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INSIGNIA (BACK COVER)

On July 1, 1957, the Army Antiaircraft Artillery and Guided Missile Center was officially renamed the Army Air Defense School. To commemorate this new designation, an official symbol for the school was introduced featuring a disc with a narrow yellow border, and two yellow bolts aligned diagonally from its base to the upper left and right that divided the disc into three sections. The outer sections were scarlet red and the center section was blue. On the blue section, a yellow perpendicular guided missile pointed upward. The scarlet red is the traditional artillery color; the blue denotes the sky into which the antiaircraft missiles are fired, while the yellow lightning bolts symbolize the electronic emanations used in electronic warfare and missile guidance.